

FACT SHEET FOR NPDES PERMIT WA-002257-8
FACILITY NAME: Lynden Wastewater Treatment Plant

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the Wastewater Discharge Permit Program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of waste water to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A—Public Involvement of the fact sheet for more detail on the public notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D—Response to Comments.

GENERAL INFORMATION	
Applicant	City of Lynden
Facility Name and Address	Lynden Wastewater Treatment Plant 800 South 6 th Street Lynden, Washington
Type of Treatment	Activated Sludge, Extended Aeration
Discharge Location	Nooksack River Latitude: 48° 56' 17" N Longitude: 122° 27' 10" W
Waterbody ID Number	01-01-1050

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The original wastewater collection system and treatment plant was built in 1930. In late 1970, the original plant was abandoned and turned into the city's water treatment plant, and the present treatment plant was built closer to the Nooksack River. Effluent is discharged to the Nooksack River. Major industries contributing to the Lynden wastewater facility today include West Farm Foods, formally known as Darigold (food processing) and Versacold (cold storage). The treatment plant was originally designed to accept 10,770 lb/day of BOD₅. The original design included an Activated Biological Filter (ABF) which accounted for up to 50 percent removal efficiency of the receiving BOD₅ load. However, the ABF unit was taken off-line in 1986 due to low BOD₅ removal efficiency during high loadings. It remains nonoperational and, therefore, the total effective capacity of the plant was reduced to 7000 lb/day or 3500 lb/day per ditch for the maximum month.

The present plant was constructed in 1977 and placed in operation in 1978. The plant originally treated domestic waste and food processing waste from a large powdered milk plant, a seasonal vegetable processing plant, and smaller fish and berry processing plant. The plant has occasionally been upset by spills from the milk plant and organic shock loads from the rapid startup of the corn processing operation. During corn processing season, the plant experienced serious sludge bulking, which was believed to be due to high carbohydrate loading from the corn processing waste. The vegetable processing plant went out of business in 1986.

The plant underwent upgrading in 2002 and 2003 which included a new headworks building, new anoxic tanks to assist with nitrogen removal, new clarifiers, new effluent filters, a new ultraviolet disinfection ditch, and a new effluent pump station. A result of the upgrading was a larger design capacity of 2.18 MGD.

TREATMENT PROCESSES

Influent enters the headworks and is pumped through three screw centrifugal pumps to screen channels on the second level of the headworks building. Screened solids and debris are discharged through a chute to a waste container on the lower level and disposed of at a local landfill. Screened wastewater flows next to a grit removal system which consists of two head cells, a slurry cup, a grit snail, and two grit pumps. A head cell contains several stacked settling trays which allow solids to settle in the trays and eventually drop through the center of the tray to the bottom of a tank. Primary sludge is pumped from the bottom of the cell to the slurry cup which operates like a cyclone separating heavier solids and lighter solids. Heavier solids drop into the grit snail which washes and removes the organics, and dewateres the grit before it is discharged to a dumpster. Lighter solids can be discharged to the other head cell or to the effluent from the grit removal system.

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A septage receiving station is located outside the headworks building and is self-contained with a mechanical screen capable of removing large debris before it mixes with influent wastewater entering the plant. At the time of drafting this permit, this part of the facility is not yet in operation.

Waste water flows from the headworks to the anoxic selectors. The anoxic selectors consist of three equally-sized tanks which are well mixed by submersible mixers, but not aerated. Two weirs of equal length split the anoxic selectors' effluent flow evenly to the facility's two oxidation ditches. The oxidation ditches achieve aeration with four 40-hp rotors each oxidizing the organic materials and reducing the biological oxygen demand (BOD) of the waste water. Liquid is pumped from the oxidation ditches to one or both of the secondary clarifiers to allow suspended solids in the liquid to settle out. Settled solids are removed from the clarifiers using a mechanical scraper at the bottom of the clarifier tanks. Solids scraped from the edge to the center of the tanks are pumped to either be thickened and eventually wasted and composted, or returned to the anoxic selectors as returned activated sludge (RAS). Skimmers attached to the scrapers and located on the liquid surface remove floatables such as grease. Clarified liquid flows over scum baffles leaving the clarifiers and flowing to the effluent filters. Two banks containing six circular cloth filters each are attached to a shaft. Each shaft has room for an additional six filters in the future. These effluent filters remove smaller solids not removed by the clarifiers. The cloth filters are periodically back washed to maintain effectiveness with the back wash being pumped to the influent pump station. The effluent filter structure has been designed to allow reuse of the effluent. Filtered effluent passes through three banks of low pressure ultraviolet (UV) lamps for disinfection. Each bank has 13 modules of 8 lamps each for a total of 312 UV lamps arranged horizontally in clear protective sleeves. The modules are removed weekly for cleaning to maintain disinfection effectiveness. Chlorine is maintained on-site as a backup disinfectant as well as sodium meta-bisulphite as dechlorination in the event it is needed. Disinfected effluent is pumped through the facility's effluent pump station to the outfall located in the Nooksack River.

The facility is classified as a Class II plant. A Class I operator shall be present at the facility during all shifts when operational changes are made to the treatment process. An operator with a Class II operator certification, certified by the State of Washington, shall be in responsible charge of the day-to-day operation of the wastewater treatment plant. There are currently four full time operators working seven days a week, eight hours a day, at the treatment plant with Class I, II, and III certification. The plant manager is a Level IV certified operator.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is continuously discharged from the facility via a submerged effluent pipe into the Nooksack River. Original drawings indicate a 20-inch diameter, F-shaped diffuser with 32, 3-inch diameter ports. An inspection of the outfall, conducted in September 2003, found that the main current or thalweg of the river had migrated toward the right bank. During this migration process, gravel and river bed substrate had covered up the diffuser ports. The inspection report stated that the end cap of one of the 20-inch diameter diffuser legs is missing and that most of the effluent flow is being discharged from this single point. This single discharge point was found to be in a 1- to 2-foot depression in the river bed with the diffuser pipe buried approximately 16 inches in the river bed substrate. Since this

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configuration is changed from the original F-shaped diffuser, the mixing zone is different and the dilution ratios were recalculated. The acute mixing zone dilution ratio was calculated as 8:1. The dilution ratio for the chronic mixing zone is calculated as 47:1. If the Permittee repairs or reconfigures the present outfall arrangement, it will likely result in new dilution ratios. New dilution ratios will require a permit modification. The city is exploring the possibility of a new location for its outfall in the future.

RESIDUAL SOLIDS

The treatment facility removes solids during the treatment of the waste water at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) being removed as part of the routine maintenance of the equipment. Grit, rags, scum, and screenings are drained and disposed of as solid waste at the local landfill. Sludge is treated on-site at the facility's composting area, and is transported to an off-site disposal area used by other wastewater treatment facilities in Whatcom County. Composted sludges are Class A and made available to the citizens of Lynden annually for domestic use. The city also wholesales its compost. Biosolid volumes in excess of what the composting facility can handle are Class B and are transported to Tjölker Farm where they are land applied under a permit from the Whatcom County Health Department.

PERMIT STATUS

The previous permit for this facility was issued on June 11, 2002. The previous permit placed effluent limitations on 5-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), pH, fecal coliform bacteria, and total residual chlorine.

An application for permit renewal was submitted to the Department on December 30, 2004, and accepted by the Department on March 31, 2005.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last compliance inspection without sampling on August 24, 2004. Its last Class II compliance inspection with sampling was conducted on September 26, 2005.

During the history of the previous permit, the Permittee has generally remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. There has been an issue of compliance with the facility's design flow beginning in July 2003 when the facility upgrade was completed. The upgrade resulted in the facility gaining capacity from 1.02 MGD to 2.18 MGD. From July 2003 to December 2004 the facility has had flow warnings and violations thirteen times. A total maximum daily load (TMDL) wasteload allocation of 28 CFU/100mL for fecal coliform was imposed by Ecology on the Nooksack River in an effort to reduce bacterial contamination in the river and its effect down stream. The Permittee requested an interim limit of 100 CFU/100mL while the facility was being upgraded. This was noted on page 11 in the fact sheet for the past permit. Once the facility was upgraded, the Permittee was notified in writing that the interim limit of 100 CFU/100mL was to be lowered to 28 CFU/100mL as of June 2003.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in Discharge Monitoring Reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

<u>Parameter</u>	<u>Concentration</u>
Ammonia (as N)	.43 mg/L (average of 26 samples)
Dissolved Oxygen	4.2 mg/L (average of 250 samples)
Nitrate/Nitrite	1.33 mg/L (average of 24 samples)
Phosphorus (total)	35.4 mg/L (average of 24 samples)

SEPA COMPLIANCE

There are presently no SEPA issues with the city of Lynden's wastewater plant.

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the surface water quality standards (Chapter 173-201A WAC), ground water standards (Chapter 173-200 WAC), sediment quality standards (Chapter 173-204 WAC), or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the February 2000 facility engineering report prepared by Earth Tech, DMR's, and the Permittee's application, and are as follows:

Table 2: Design Standards for Lynden WWTP.

Parameter	Design Quantity
Monthly average flow (max. month)	2.18 MGD
Monthly average dry weather flow	.875 MGD ¹
Monthly average wet weather flow	1.126 MGD ²
Instantaneous peak flow	6.82 MGD
BOD ₅ influent loading	9114 lb/day
TSS influent loading	8000 lb/day
Design population equivalent	10,000 ³

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, TSS, and chlorine, taken from Chapter 173-221 WAC, are:

Table 3: Technology-based Limits.

Parameter	Limit
pH	Shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 28 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
Chlorine	Average Monthly Limit = 0.3 mg/L Average Weekly Limit = 0.6 mg/L

¹ This value is derived as an arithmetic average based on DMR's from the previous permit cycle. Dry months are October through April.

² This value is derived as an arithmetic average based on DMR's from the previous permit cycle. Wet months are May through September.

³ This information comes from the Permittee's application.

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The chlorine limit is included in the event that it is needed as a backup disinfectant. Dechlorination is also available at the facility.

The existing permit has a chlorine limit of 10.5 pounds as a weekly average limit, and the facility is able to comply with it. The proposed permit includes the same limit.

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings for BOD₅ and TSS (lb/day) were calculated as the maximum monthly design flow (2.18 MGD) x concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 545.4 lb/day.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 818.0 lb/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established surface water quality standards. The Washington State surface water quality standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

A total maximum daily load (TMDL) has been developed and approved for the Nooksack River to address high counts of fecal coliform bacteria found in portions of the river below Deming. Fecal coliform bacteria can indicate the presence of other bacteria that may be pathogens. This indication is cause to consider the Nooksack as impaired. High counts of fecal coliform bacteria have in the past closed commercial shellfish beds beyond the mouth of the Nooksack River. The TMDL, also called a water cleanup plan, establishes a target more stringent than Washington State standards on fecal coliform bacteria in the Nooksack. The monthly target geometric mean is 39 colony forming units (CFU) for the receiving water, though for this target to be met a monthly average limit of 28 CFU/100mL is being given to the three wastewater plants discharging to the Nooksack to meet the target. Wasteload allocations for fecal coliform bacteria are designed to meet target conditions in the river without a dependence on mixing.

⁴ This chlorine limit is included in this permit as a back-up disinfection system in the event the ultraviolet (UV) light disinfection system presently in place fails, becomes inoperative, or is taken off-line for cleaning, repair, or other maintenance.

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's water quality standards for surface waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the water quality standards are used along with chemical and physical data for the waste water and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other diseases and are primarily applicable to fish and shellfish consumption and drinking water from surface waters. Two chemicals, toluene and phenol, were reported in the Permittee's application. A reasonable potential calculation was performed, and it was found that no reasonable potential existed (see Appendix C).

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic waterbody uses.

MIXING ZONES

The water quality standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known available and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

A mixing zone study was required during the last permit. That study reported that conditions surrounding the outfall had changed since the last mixing zone study. Due to these changes the facility has been given new acute and chronic dilution ratios. These ratios are reflected in the permit.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Nooksack River which is designated as a Class A receiving water in the vicinity of the outfall. Significant nearby non-point sources of pollutants include urban and agricultural stormwater. Characteristic uses include the following:

water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	100 CFU/100 mL maximum geometric mean ⁵
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

⁵ WAC 173-201A-030 lists Class A waters as having a geometric mean of 100 colony forming units (CFU)/100 mL, however, the Nooksack River has a total maximum daily load (TMDL) imposed a geometric mean for fecal coliform bacteria of 28 CFU/100 mL.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

	Acute	Chronic
Aquatic Life	8	47

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Nooksack River is the seven-day average low river flow with a recurrence interval of ten years (7Q10). Ambient data at critical conditions in the vicinity of the Lynden outfall were taken from the permit application, and outfall study which had an intensive monitoring study conducted in September 2004. The ambient background data used for this permit includes the following from Ecology's closest ambient monitoring site located at North Cedarville approximately five miles upstream:

Parameter	Value used
7Q10 Low Flow	1,080 cfs
Velocity	2.4 ft/sec
Depth	2.65 feet
Width	136 feet
Roughness (Manning)	n = 0.039
Slope	4.12 E-03 (0.24 degrees)
Temperature	14.6° C
pH (high)	7.7
Dissolved Oxygen	10.0 mg/L
Total Ammonia-N	0.07 mg/L
Fecal Coliform	41/100 mL dry weather (>100/100 mL storm related)
Conductivity	83 ⁶
Salinity	0.0

⁶ This number comes from Ecology's River and Stream Water Quality Monitoring unit and is derived as an arithmetic average of three years of data for the August sampling date.

Turbidity	18 ³ NTU
Hardness	25.3 mg/L as CaCO ₃
Lead	0.0
Copper	3.8 µg/L (total recoverable estimated value)
Zinc	3.6 µg/L (total recoverable estimated value)
All Other Metals	0.0 (below detection limits)

BOD₅—Under critical conditions, there is no predicted violation of the water quality standards for surface waters. Therefore, the technology-based effluent limitation for BOD₅ was placed in the permit.

Under critical conditions, there is no predicted violation of the water quality standards for surface waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

Under critical conditions, there is no predicted violation of the water quality standards for surface waters. Therefore, the technology-based effluent limitations for pH were placed in the permit and temperature was not limited.

Fecal Coliform—Under critical conditions, there was a prediction of a violation of the fecal coliform criterion for the receiving water with the technology-based limit. A total maximum daily load (TMDL) has been conducted for the lower Nooksack River, which is the receiving water for the Permittee's effluent. It was found that fecal coliform bacteria levels were exceedingly high in the river. To bring these bacteria levels down, it was found that limits for point and non-point sources would have been proposed for the Nooksack River. An average monthly effluent limit of 28 organisms/100 ml was found to be protective of the fecal coliform criterion and therefore was imposed instead of the technology-based limitation.

Toxic Pollutants—Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the water quality standards for surface waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: ammonia, phosphorus, chromium, copper, nickel, zinc, cyanide, toluene, and phenol. A reasonable potential analysis (see Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for ammonia, phosphorus, chromium, copper, nickel, zinc, cyanide, toluene, phenol to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs during July, August, and September. The parameters used in the critical condition modeling are as follows: acute dilution factor 8:1, chronic dilution factor 47:1, receiving water temperature 18° C, receiving water alkalinity 25.3 (as mg CaCO₃/L).

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No valid ambient background data was available for toluene or phenol. A determination of reasonable potential using zero for background resulted in no reasonable potential.

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

Valid ambient background data was available for ammonia, phosphorus, chromium, copper, nickel, zinc, and cyanide. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

WHOLE EFFLUENT TOXICITY

The water quality standards for surface waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the waste water in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their waste water with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses, such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center at (360) 407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

An effluent characterization for acute and chronic toxicity was conducted during a previous permit term. In accordance with WAC 173-205-060, the Permittee must repeat this effluent characterization for the following reason:

An increase in effluent toxicity was detected during testing and the proposed permit requires continued effluent characterization because toxicity in excess of a performance standard has been demonstrated during toxicity testing. In accordance with WAC 173-205-060(3), the proposed permit requires another effluent characterization for acute toxicity using daphnids.

Acute toxicity was measured once during effluent characterization in the previous permit term. Acute toxicity was found to be at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. An acute toxicity limit is therefore required. The acute toxicity limit is no statistically significant difference in test organism survival between the acute critical effluent concentration (ACEC), 12.5% of the effluent, and the control.

The acute toxicity limit is set relative to the zone of acute criteria exceedence (acute mixing zone) established in accordance with WAC 173-201A-100. The acute critical effluent concentration (ACEC) is the concentration of effluent existing at the boundary of the acute mixing zone during critical conditions.

Monitoring for compliance with an acute toxicity limit is accomplished by conducting an acute toxicity test using a sample of effluent diluted to equal the ACEC and comparing test organism survival in the ACEC to survival in nontoxic control water. The Permittee is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the ACEC and the control.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on knowledge of data or process information indicating regulated chemicals occurring in the discharge. A determination of the discharge's potential to cause an exceedence of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the *Technical Support Document for Water Quality-based Toxics Control* (EPA/505/2-90-001) and the Department's *Permit Writer's Manual* (Ecology Publication 92-109, July 1994). The determination indicated that the discharge has no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has been unable to determine at this time the potential for this discharge to cause a violation of sediment quality standards. To help determine whether or not the facility is effecting sediment quality in the area or down stream, the facility will need to have a sediment grain size analysis performed according to the Puget Sound Protocols. If the Department determines in the future that there is a potential for violation of the sediment quality standards, an order will be issued to require the Permittee to demonstrate that either the point of discharge is not an area of deposition or, if the point of discharge is a depositional area, that there is not an accumulation of toxics in the sediments.

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GROUND WATER QUALITY LIMITATIONS

The Department has promulgated ground water quality standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for an activated sludge, extended aeration waste water facility.

LAB ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for:

<u>Parameters</u>	<u>Methods</u>
BOD ₅	SM 5210-B
Total Suspended Solids	SM 2540 D
Total Volatile Solids	SM 2540 E
pH	SM 4500-E
Alkalinity	SM 2320 B (4c)
Chlorine, total residual	SM 4500-Cl G
Fecal Coliform Bacteria	SM 9222 D
Dissolved Oxygen	SM 4500-O G
Orthophosphate	HACH 8048

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems, the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state water quality standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the Whatcom County Health Department. The Lynden wastewater treatment plant has a sludge composting facility on site. Final sludges are sent to one-of-two aerobic digesters after being thickened by rotary drum thickeners. The aerobic digesters reduce the volume of the sludge over several days. Digested sludges are either sent on to a sludge storage area before composting or can be trucked off-site for land disposal. Sludges to be composted are moved through two separate centrifuges for further dewatering before they are introduced to the composting facility.

Requirements for monitoring sewage sludge and record keeping are included in a separate permit. This information will be used by Ecology to develop or update local limits and is also required under 40 CFR 503.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the “Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10” (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program [i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)]. Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, Part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program (40 CFR 403.8(f)(1)(iii)), the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing state waste discharge permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)]. (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.) Industrial dischargers need to apply for a state waste discharge permit 60 days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with state water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities [40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.].

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a state waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a state waste discharge permit application.

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. Definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition, wastes with excessive BOD, petroleum-based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular, assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit Condition S.9 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. This is due to the dynamic nature of river sediments and their ability to drastically change. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall. By 2010, with the next permit application the inspection report shall be submitted to the Department. If the Permittee decides to repair, replace, or alter the outfall or diffuser, the Permittee is required to notify the Department in writing at least 60 days prior to the

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above actions. If the outfall is repaired, replaced, or altered from its present condition, the Permittee shall perform a mixing zone analysis in accordance with *Guidance for Conducting Mixing Zone Analyses* (Ecology, 1996) to determine if the mixing zone has changed, what the dilution ratios are, and submit a Mixing Zone Analysis Report to the Department.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary, to meet water quality standards, sediment quality standards, or ground water standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for 5 years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

Laws and Regulations (<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on March 30, 2005, in the *Lynden Tribune* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on date, in name of publication to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Bellingham Field Office
1204 Railroad Avenue Suite 200
Bellingham, WA 98225

and

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, email, fax, or by writing to the address listed above.

This permit and fact sheet were written by Mark Henderson.

APPENDIX B—GLOSSARY

Acute Toxicity—The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART—An acronym for “all known available and reasonable methods of prevention, control, and treatment.”

Ambient Water Quality—The existing environmental condition of the water in a receiving waterbody.

Ammonia—Ammonia is produced by the breakdown of nitrogenous materials in waste water. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect waste water.

Average Monthly Discharge Limitation—The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation—The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)—Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅—Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass—The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅—The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

Chlorine—Chlorine is used to disinfect waste waters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

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Chronic Toxicity—The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)—The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)—The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling—A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling—A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample—A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity—Clearing, grading, excavation, and any other activity which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous Monitoring—Uninterrupted, unless otherwise noted in the permit.

Critical Condition—The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor—A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10 percent by volume and the receiving water 90 percent.

Engineering Report—A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

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Fecal Coliform Bacteria—Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample—A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Industrial User—A discharger of waste water to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater—Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)—"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference—A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility—A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation—The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)—The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

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Minor Facility—A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone—A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)—The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

Pass Through—A discharge which exits the POTW into waters of the state in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of state water quality standards.

pH—The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User—A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day; or
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)—A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)—

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

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Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater—That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)—Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset—An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit—A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C—TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov/programs/wq/wastewater/index.html>

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Parameter	State Water Quality Standard				Max concentration at				Effluent percentile value				Max effluent conc. measured (metals as recoverable)				COMMENTS			
	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Concentration (metals as dissolved)	Chronic	Acute	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic	Chronic
	0.98	0.98	1.4000	176.3100	57.1900	1.59	1.43	NO	0.95	0.368	1.00	0.60	0.55	3	3.00	8	47			
chromium	0.98	0.98	1.4000	176.3100	57.1900	1.59	1.43	NO	0.95	0.368	1.00	0.60	0.55	3	3.00	8	47			
copper	1.00	1.00	1.3100	4.6100	3.4700	1.90	1.41	NO	0.95	0.368	2.00	0.60	0.55	3	3.00	8	47			
nickel	1.00	1.00	3.2200	438.0600	48.6500	3.83	3.32	NO	0.95	0.368	2.70	0.60	0.55	3	3.00	8	47			
zinc	1.00	1.00	3.8000	35.3600	32.2900	19.82	6.53	NO	0.95	0.368	44.00	0.60	0.55	3	3.00	8	47			
cyanide				22.0000	5.2000	4.12	0.70	NO	0.95	0.368	11.00	0.60	0.55	3	3.00	8	47			
phenol						0.67	0.11	YES	0.95	0.368	1.80	0.60	0.55	3	3.00	8	47			
toluene						0.37	0.06	YES	0.95	0.368	1.00	0.60	0.55	3	3.00	8	47			

FACILITY NAME: LYNDEN WASTEWATER TREATMENT PLANT

Revised 3/00	Ambient Concentration (Geometric Mean)	Water Quality Criteria for Protection of Human Health	Max concentration at edge of chronic mixing zone.	LIMIT REQ'D?	Expected Number of Compliance Samples per Month	AVERAGE MONTHLY EFFLUENT LIMIT ug/L	MAXIMUM DAILY EFFLUENT LIMIT ug/L	Estimated Percentile at 95% Confidence	Pn	Max effluent conc. measured ug/L	Coeff Variation CV	# of samples from which # in col. K was taken n	Multiplier	Calculated 50th percentile Effluent Conc. (When n>10) Dilution Factor
Parameter	ug/L	ug/L	ug/L		Month	ug/L	ug/L			ug/L		s		
phenol	0.0000	21000	1.80	NO		NONE	NONE	0.50	0.37	1.8	0.60	3	1.20	47.0
toluene	0.0000	1000	1.00	NO		NONE	NONE	0.50	0.37	1	0.60	3	1.20	47.0

Calculation Of Ammonia Concentration and Criteria for fresh water. Based on EPA Quality Criteria for Water (EPA 400/5-86-001) and WAC 173-201A. Revised 1-5-94 (corrected total ammonia criterion). Revised 3/10/95 to calculate chronic criteria in accordance with EPA Memorandum from Heber to WQ Stds Coordinators dated July 30, 1992.

INPUT

- | | |
|---|------|
| 1. Ambient Temperature (deg C; 0<T<30)(yearly arimatic average) | 7.9 |
| 2. Ambient pH (6.5<pH<9.0)(yearly arimatic average) | 7.60 |
| 3. Acute TCAP (Salmonids present- 20; absent- 25) | 20 |
| 4. Chronic TCAP (Salmonids present- 15; absent- 20) | 15 |
-

OUTPUT

- | | |
|--|---------|
| 1. Intermediate Calculations: | |
| Acute FT | 2.31 |
| Chronic FT | 2.31 |
| FPH | 1.30 |
| RATIO | 16 |
| pKa | 9.80 |
| Fraction Of Total Ammonia Present As Un-ionized | 0.6245% |
| 2. Un-ionized Ammonia Criteria | |
| Acute (1-hour) Un-ionized Ammonia Criterion (ug NH3/L | 86.4 |
| Chronic (4-day) Un-ionized Ammonia Criterion (ug NH3/L | 17.0 |
| 3. Total Ammonia Criteria: | |
| Acute Total Ammonia Criterion (mg NH3+ NH4/L) | 13.8 |
| Chronic Total Ammonia Criterion (mg NH3+ NH4/L) | 2.7 |
| 4. Total Ammonia Criteria expressed as Nitrogen: | |
| Acute Ammonia Criterion as mg N | 11.4 |
| Chronic Ammonia Criterion as N | 2.24 |

APPENDIX D—RESPONSE TO COMMENTS

The site plan illustrates the layout of a wastewater treatment plant. Key features include:

- Entrance:** Located at the top right, with an arrow pointing to the main access road.
- AS TANK ACCESS ROAD:** A road running horizontally across the middle of the site.
- Buildings:**
 - LIQUID SLUDGE HOLDING:** A large circular tank at the top left.
 - ASBESTIC DUCTILE NO. 1:** A circular tank below the liquid sludge holding tank.
 - SLUDGE THICKENER BUILDING:** A rectangular building between the two asbestos ductile tanks.
 - ASBESTIC DUCTILE NO. 2:** A circular tank below the sludge thickener building.
 - OPERATION NO. 2:** A large rectangular building in the center.
 - OPERATION DITCH NO. 1:** A long, narrow rectangular ditch to the right of the operation no. 2 building.
 - OPERATION TOWER:** A rectangular building to the right of the operation no. 2 building.
 - OPERATION DITCH NO. 2:** A long, narrow rectangular ditch to the right of the operation tower.
 - HEAVYWEIGHT BUILDING:** A rectangular building at the bottom left.
 - ASBESTIC SELECTORS BUILDING:** A rectangular building to the right of the heavy weight building.
 - SECONDARY CLARIFIER NO. 1:** A large circular tank to the right of the asbestos selectors building.
 - SECONDARY CLARIFIER NO. 2:** A large circular tank to the right of the secondary clarifier no. 1.
 - THICKENED SLUDGE HOLDING TANK:** A circular tank to the right of the secondary clarifier no. 2.
 - SLUDGE DRYING BUILDING:** A rectangular building at the bottom right.
 - COMPOST BUILDING:** A large rectangular building at the bottom right.
- Tanks and Infrastructure:**
 - EFFLUENT PUMP STATION:** A small rectangular building near the top left.
 - PERMEABLE PLATE:** A rectangular plate near the effluent pump station.
 - UV CHANNEL:** A rectangular channel near the permeable plate.
 - 3M WATER WALL:** A rectangular wall near the UV channel.
 - SWITCH:** A small rectangular building near the 3M water wall.
 - TRANSFORMER:** A small rectangular building near the switch.
 - FILTER:** A rectangular building near the transformer.
 - 5.5 GPM SAN TANK:** A small circular tank near the filter.
- Other Features:**
 - OPERATION DITCH:** A large, irregularly shaped ditch in the center of the site.
 - OPERATION DITCH NO. 1:** A long, narrow rectangular ditch to the right of the operation no. 2 building.
 - OPERATION DITCH NO. 2:** A long, narrow rectangular ditch to the right of the operation tower.
 - OUTFALL TO MONSIEUR RIVER:** A line indicating the outfall point to the river.
 - SCALE 1" = 100'**: A scale bar at the top left.
 - NORTH:** A north arrow at the top left.

FACILITY NAME: LYNDEN WASTEWATER TREATMENT PLANT

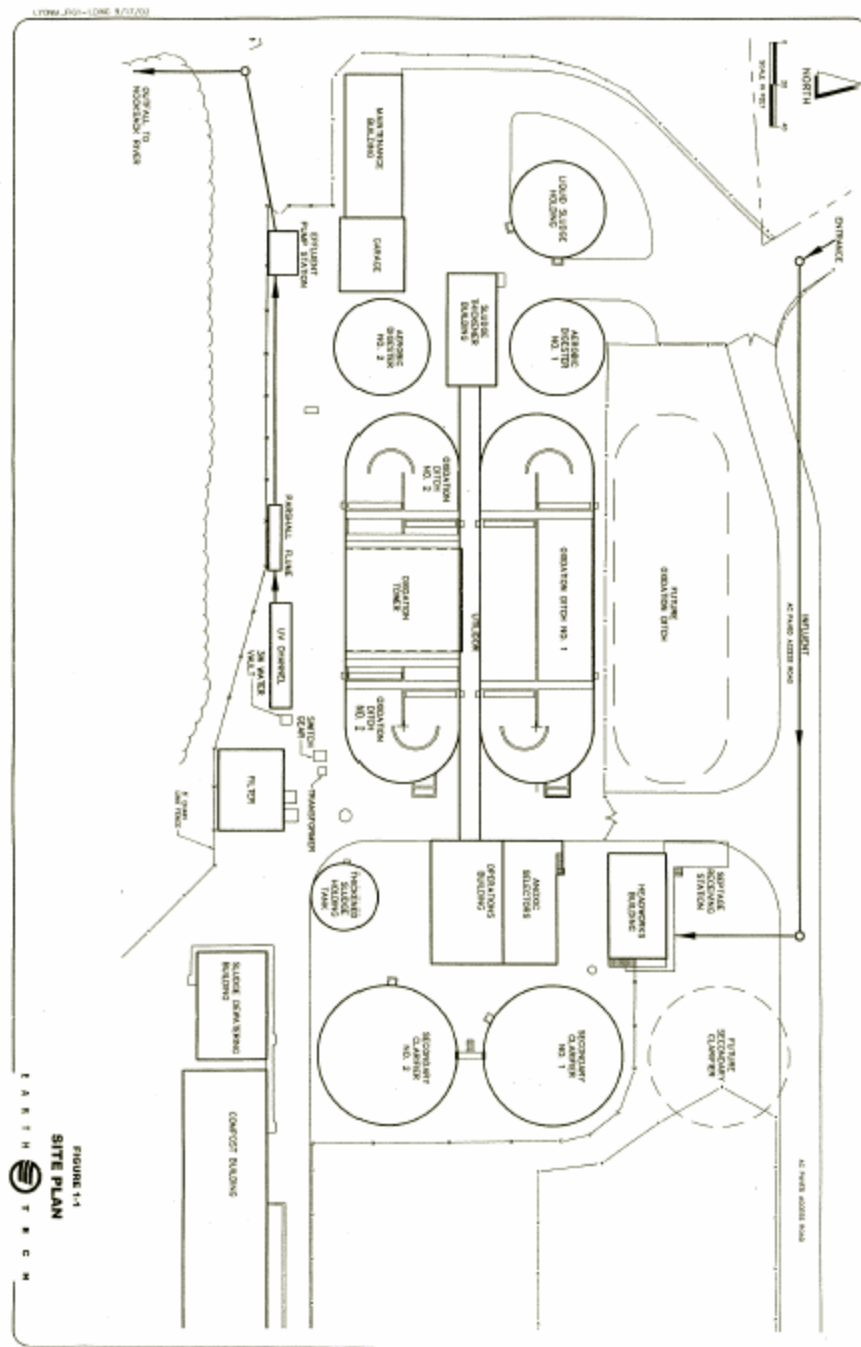


FIGURE 1-1
SITE PLAN
E A R H T R C M